Central Valley Regional Water Quality Control Board
7/8 June 2012 Board Meeting

Response to Comments
for the
City of Nevada City
City of Nevada City Wastewater Treatment Plant
Tentative Waste Discharge Requirements

The following are Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) staff responses to comments submitted by interested parties regarding the tentative Waste Discharge Requirements for NPDES Permit No. CA0079901 (NPDES Permit) renewal for the City of Nevada City (hereinafter Discharger) Wastewater Treatment Plant (Facility).

The tentative NPDES Permit was issued for a 30-day public comment period on 20 March 2012 and comments were due 23 April 2012. The Central Valley Water Board received public comments regarding the tentative NPDES Permit by the due date from the following interested parties:

- Discharger
- California Sportfishing Protection Alliance (CSPA)
- Central Valley Clean Water Association (CVCWA)

Changes were made to the tentative NPDES Permit based on public comments received. The submitted comments were accepted into the record, and are summarized below, followed by Central Valley Water Board staff responses.

DISCHARGER COMMENTS

Discharger Comment 1. No Reasonable Potential for Lead.

The Discharger comments that there is no reasonable potential for lead in the effluent to cause or contribute to the exceedance of a water quality objective in the receiving water. Most of the effluent lead results were reported as non-detect and the highest reported value was unquantifiable and estimated at 0.3 µg/L. None of the effluent results were near the lowest effluent water quality objective of 1.70 µg/L, or the lowest calculated water quality based effluent limitation of 1.4 µg/L. The Discharger believes that it is not appropriate to include an effluent limit for lead at this time, and that there is no evidence of risk to the environment, yet there are costs for sampling, analysis, and reporting. The Discharger requested that staff remove the lead effluent limitation.

RESPONSE: Central Valley Water Board staff does not concur with the Discharger's request. In the effluent, staff concurs that the lead was detected in five of the eleven effluent samples, and the sample concentrations were not quantifiable in all five detections. However, the background receiving water was sampled two times for lead. In both samples lead was detected with one result being quantifiable at a concentration of 0.448 µg/L. The calculated water quality criteria for the receiving water based on the minimum receiving water hardness (14 mg/L) is

0.26 µg/L. The Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP), section 1.3, Step 6, requires that if the pollutant concentration in the receiving water is above the water quality criteria and the pollutant is measured in the effluent, an effluent limitation must be established in the NPDES Permit. Therefore, the proposed NPDES Permit contains an effluent limitation for lead. However, since detections of lead in the effluent are consistently below the water quality criteria and below the calculated lead effluent limitations, the Monitoring and Reporting Program of the proposed NPDES Permit was changed to reduce effluent lead monitoring, requiring effluent lead monitoring on a quarterly basis instead of on a monthly basis.

Discharger Comment 2. Receiving Water Monitoring for Electrical Conductivity (EC) and Hardness.

The Discharger comments that monthly monitoring of the upstream and downstream receiving water for EC and hardness should be removed. There are no receiving water limitations for EC or hardness, and EC and hardness samples are collected as part of the Effluent and Receiving Water Characterization (ERWC) Study included in the tentative NPDES Permit.

RESPONSE: Central Valley Water Board staff concurs, in part. The proposed NPDES Permit includes the EC effluent limitation, "The annual average effluent electrical conductivity shall not exceed the municipal water supply electrical conductivity plus an increment of 500 µmhos/cm, or 700 µmhos/cm, whichever is less." The average effluent EC concentration is 295 µmhos/cm and the maximum effluent EC concentration measured 388 µmhos/cm, which is below the EC limit. The discharge does not show reasonable potential to cause or contribute to the exceedance of a water quality objective in the receiving water, some samples for EC will be obtained during the ERWC Study, and EC concentrations in the receiving water are not essential measurements to determine the effectiveness of the treatment facility. Therefore, the proposed NPDES Permit was changed and the EC receiving water monitoring is no longer required in the Monitoring and Reporting Program (MRP). However, the Discharger is still required to monitor EC as part of the ERWC Study.

Central Valley Water Board staff concurs that the downstream receiving water hardness is not an essential measurement to determine the effectiveness of the treatment facility or for determining compliance with water quality objectives. Therefore, downstream receiving water monitoring for hardness has been removed from the MRP in the proposed NPDES Permit. However, having a robust set of data for upstream, or background, receiving water hardness is critical to determining the toxicity of hardness dependent metals in the discharge and receiving water. The Discharger only monitored hardness in the receiving water on three occasions: August 2011, October 2011, and November 2011. Hardness and pH of the receiving water are important in determining, for instance, aluminum toxicity (see response to CSPA Comment H). The proposed NPDES Permit does not require the

Discharger to conduct an aluminum toxicity study because of the limited data to assess the receiving water's water quality characteristics and thus toxicity to aquatic life. Therefore, the proposed NPDES Permit appropriately requires monthly monitoring for hardness of the upstream receiving water.

CSPA COMMENTS

Designated Status Request: CSPA requested designated party status for the Central Valley Water Board hearing scheduled for 7/8 June 2012 with regard to the proposed NPDES Permit renewal for the City of Nevada City Wastewater Treatment Plant. CSPA will be granted designated party status for the subject hearing.

CSPA Comment A. The Proposed Permit Fails to Contain Mass-Based Effluent Limits for Chlorine, Dichlorobromomethane, and Lead.

CSPA comments that the proposed NPDES Permit fails to contain mass-based effluent limitations for chlorine, dichlorobromomethane, and lead as required by 40 CFR 122.45 (b) and 40 CFR 122.45 (f).

RESPONSE: Central Valley Water Board staff does not concur. 40 CFR 122.25(f) states the following:

"Mass limitations.
(1) All pollutants limited in permits shall have limitations, standards or prohibitions expressed in terms of mass except:

(i) For pH, temperature, radiation, or other pollutants which cannot appropriately be expressed by mass;

(ii) When applicable standards and limitations are expressed in terms of other units of measurement; or

(iii) If in establishing permit limitations on a case-by-case basis under §125.3, limitations expressed in terms of mass are infeasible because the mass of the pollutant discharged cannot be related to a measure of operation (for example, discharges of TSS from certain mining operations), and permit conditions ensure that dilution will not be used as a substitute for treatment."

40 CFR section 122.25(f)(1)(ii) states that mass limitations are not required when applicable standards are expressed in terms of other units of measurement. The numerical effluent limitations for chlorine, dichlorobromomethane, and lead in the proposed NPDES Permit are based on water quality standards and objectives, and are expressed in terms of concentration. Therefore, the proposed NPDES Permit is not required by federal regulations to also contain a mass-based effluent limitation for these constituents.

CSPA Comment B. Effluent Limitations for EC are Improperly Regulated as an Annual Average.

CSPA comments that the effluent limitations for EC are improperly regulated as an annual average, and average weekly and average monthly effluent limitations are required unless impracticable, per Federal Regulations 40 CFR 122.45(d)(2).

RESPONSE: Central Valley Water Board staff does not concur. As discussed in the proposed NPDES Permit, there is no reasonable potential for the discharge to cause or contribute to an in-stream excursion of the applicable water quality objectives for EC. Therefore, water quality-based effluent limits are not required. However, since the Discharger discharges to Deer Creek a tributary of the Yuba River and eventually the Sacramento-San Joaquin Delta, of additional concern is the salt contribution to Delta waters. Thus, the proposed NPDES Permit contains EC effluent limitations based on performance of the Facility that are more stringent than necessary to protect the beneficial uses of the receiving water. For EC, annual average performance-based effluent limitations are appropriate, due to fluctuations that can occur in the Discharger's effluent caused by changes in its water supply EC. Consequently, it is impracticable to calculate performance-based effluent limitations for EC on a shorter averaging period, and therefore, the proposed NPDES Permit is consistent with federal regulations.

Existing Order R5-2008-0177 contains an annual average performance-based effluent limitation for EC of the municipal water supply EC plus an increment of 500 µmhos/cm, or 700 µmhos/cm, whichever is less. The proposed NPDES Permit contains the same annual average performance-based effluent limitation for EC. The proposed NPDES Permit also requires the Discharger to update its Salinity Evaluation and Minimization Plan.

CSPA Comment C. The Proposed Permit Does Not Contain Effluent Limitations for Chronic Toxicity.

CSPA comments that the proposed NPDES Permit does not contain effluent limitations for chronic toxicity and therefore does not comply with the Federal Regulations, at 40 CFR 122.44 (d)(1)(i) and the SIP.

RESPONSE: Central Valley Water Board staff does not concur. Based on whole effluent chronic toxicity testing performed from May 2009 through May 2011 and as detailed in the Fact Sheet section IV.C.5.b., the discharge does not have reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective. The reasonable potential analysis is performed pollutant-by-pollutant, including toxicity. Pursuant to Section 1.3 of the SIP, the proposed NPDES Permit does include whole effluent chronic toxicity monitoring to demonstrate compliance with the narrative toxicity objective. A reopener provision is

included that allows the permit to be opened to add a chronic toxicity effluent limit if chronic WET monitoring data demonstrates there is reasonable potential.

CSPA Comment D. The Permit Fails to Require that Analysis of Water Quality be Performed by a Certified Laboratory.

CSPA comments that the proposed NPDES Permit allows water quality analysis to be performed by a non-certified laboratory, contrary to California Water Code section 13176.

RESPONSE: Central Valley Water Board staff does not concur. It is not factually or legally possible for the Discharger to comply with the requirements of Water Code section 13176 in the manner suggested by CSPA. The Central Valley Water Board cannot specify the manner of compliance with section 13176. A certified laboratory would have to send out its personnel and lab equipment to collect an onsite sample for chlorine residual, dissolved oxygen, pH, and temperature at the City of Nevada City treatment facility and receiving water. Due to the holding time requirements, it is not possible for the sample to be returned to a certified lab for proper analysis after collection at the Discharger's Facility. It is not legally or factually possible to require ELAP certification of individual personnel or equipment not affiliated with a certified laboratory, because ELAP only certifies laboratories. Finally, section 13176 cannot be interpreted in a manner that would violate federal holding time requirements that apply to NPDES permits pursuant to the Clean Water Act. (Wat. Code §§ 13370, subd. (c), 13372, 13377.)

The proposed NPDES Permit, General Monitoring Provisions section I.C. of Attachment E - Monitoring and Reporting Program, has been revised to clarify permit requirements, as follows:

C. *Chemical, bacteriological, and bioassay analyses of any material required by this Order shall be conducted by a laboratory certified for such analyses by the Department of Public Health (DPH). Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Central Valley Water Board. In the event a certified laboratory is not available to the Discharger for any onsite field measurements such as pH, turbidity, temperature, and residual chlorine, such analyses performed by a noncertified laboratory will be accepted provided <u>that the analysis is in accordance with 40 CFR 136 or an USEPA approved alternative test procedure, and</u> a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program for any onsite field measurements such as pH, turbidity, temperature, and residual chlorine must be kept onsite in the treatment facility laboratory and shall be available for inspection by Central Valley Water Board staff. The Quality Assurance-Quality Control Program must conform to USEPA guidelines or to procedures approved by the Central Valley Water Board.*

CSPA Comment E. Antibacksliding Requirements.

CSPA comments that the proposed NPDES Permit contains effluent limitations less stringent than the existing permit contrary to the antibacksliding requirements of the Clean Water Act and Federal Regulations, 40 CFR 122.44 (l)(1). CSPA states that the existing Order R5-2008-0177 contained effluent limitations for carbon tetrachloride, chronic whole effluent toxicity, copper, dichlorobromomethane, nitrate plus nitrite, nitrite, settleable solids, and zinc which have been removed in the tentative NPDES Permit.

RESPONSE: For CTR hardness-dependent metals including copper and zinc, a 2006 Study developed procedures for calculating the effluent concentration allowance (ECA). (See following Response to CSPA Comment F) Using new receiving water and effluent monitoring data obtained since adoption of existing Order R5-2008-0177, from December 2008 through September 2011, Central Valley Water Board staff evaluated all discharge conditions (e.g. high and low flow conditions) and the hardness and metals concentrations of the effluent and receiving water to determine the appropriate ECA. Central Valley Water Board staff believes that this new method developed in the 2006 Study is superior to relying on downstream receiving water samples alone because it captures all possible mixed conditions in the receiving water, as shown in section IV.C.2.e. of the Fact Sheet in the proposed NPDES Permit. Based on all this new hardness information not available at the time of adoption of existing Order R5-2008-0177, there is not a reasonable potential for the effluent from the Facility to cause or contribute to an excursion above applicable water quality standards for copper and zinc.

The Discharger made operational changes in August 2010 to the treatment system (lime addition) to control pH and improve the nitrification process. Monitoring data obtained since this operational change indicates that there is not a reasonable potential for the effluent from the Facility to cause or contribute to an excursion above applicable water quality standards for nitrate plus nitrite, and nitrite.

For all other constituents, including whole effluent toxicity, monitoring data used to conduct the reasonable potential analysis (RPA) and to establish effluent limitations in the proposed NPDES Permit were based on new information and monitoring data obtained since the adoption of the existing Order R5-2008-0177. Central Valley Water Board staff believes that using monitoring data gathered since the adoption of existing Order R5-2008-0177 is representative of the discharge conditions. Generally, the use of more recent monitoring data is preferred as it is more representative of current discharge conditions and because data quality assurance/quality control (QA/QC) improves with time.

Based on this monitoring data, there is not a reasonable potential for the effluent from the Facility to cause or contribute to an excursion above the applicable water quality standards. Therefore, the proposed NPDES Permit appropriately does not contain effluent limitations for carbon tetrachloride, chronic whole effluent toxicity, copper, nitrate plus nitrite, nitrite, settleable solids, and zinc, since the concentrations of these constituents were not detected in the discharge above applicable water quality standards. Based on this new information and corresponding results of a reasonable potential analysis the proposed NPDES Permit is consistent with anti-backsliding requirements of 40 CFR 122.44(l)(2)(i)(B)(*1*).

The effluent limitations for dichlorobromomethane have been recalculated using allowable dilution credit from an approved mixing zone study. As discussed in the proposed NPDES Permit, Fact Sheet section IV.C.2, the mixing zone complies with the SIP and the Basin Plan, and the increase in concentration of the pollutant in the receiving water downstream of the mixing zone will not adversely impact beneficial uses. Therefore, the proposed NPDES Permit appropriately includes effluent limitations for dichlorobromomethane that are less stringent than the existing Permit, using new information provided in a mixing zone study.

Additionally, pursuant to CWA section 303 (d)(4), backsliding may be allowed for water quality based effluent limits if there is compliance with the federal and state antidegradation policies. In this case, water quality based effluent limits established in existing Order R5-2008-0177 for carbon tetrachloride, chronic toxicity, copper, nitrate plus nitrite, nitrite, settleable solids, and zinc were not retained in the proposed NPDES Permit. This complies with federal and state antibacksliding requirements because there will be no additional degradation based on a reasonable potential analysis conducted on sample data gathered since the adoption of the existing Order R5-2008-0177 establishing no reasonable potential for these constituents. The Fact Sheet discusses the Central Valley Water Board's finding that the Discharger is implementing best practical treatment or control (BPTC) in accordance with Clean Water Act sections 303(d)(4) and 402(o), and consistent with applicable anti-backsliding requirements of 40 CFR 122.44(l)(2)(i)(B)(*1*).

CSPA Comment F. The Proposed Permit Establishes Effluent Limitations for Metals Based on Hardness of the Effluent.

CSPA comments that the tentative NPDES Permit uses the effluent hardness of 75 mg/L, rather than the upstream ambient hardness of 14 mg/L, in determining reasonable potential for hardness dependent metals and for establishing limitations, contrary to Federal Regulations, the California Toxics Rule (CTR, 40 CFR 131.38(c)(4)).

RESPONSE: Central Valley Water Board staff does not concur. CSPA contends that the proposed NPDES Permit establishes effluent limits for CTR metals based on the incorrect hardness. CSPA has five main arguments:

a) Effluent hardness cannot be used in any way to establish CTR criteria;
b) The wrong equations were used to calculate the CTR criteria;
c) The "ambient" Hardness was not used;
d) The "Emerick" paper cannot be used; and
e) The wrong method is used for establishing a protective limitation.

a) Effluent hardness cannot be used in any way to establish CTR criteria;

The proposed NPDES Permit establishes the CTR hardness-dependent metals criteria based on the reasonable worst-case downstream ambient hardness in accordance with the CTR and the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP), and is consistent with the guidance provided by the State Water Resources Control Board (State Water Board) in WQO 2008-0008 (City of Davis).

The methodology for calculating effluent limits for metals with CTR hardness dependent criteria described in the proposed NPDES Permit establishes the criteria based on the reasonable worst-case downstream ambient hardness and ensures these metals in the discharge do not cause receiving water toxicity under any downstream receiving water condition. Under the methodology, all hardness conditions that could occur in the ambient downstream receiving water after the effluent has mixed with the water body were considered. The proposed effluent limitations are fully protective of aquatic life in all areas of the receiving water affected by the discharge under all flow conditions, at the fully mixed location, and throughout the water body including at the point of discharge into the water body.

The SIP and the CTR require the use of "receiving water" or "actual ambient" hardness, respectively, to determine effluent limitations for these metals. (SIP, § 1.2; 40 CFR § 131.38(c)(4)) The CTR does not define whether the term "ambient," as applied in the regulations, necessarily requires the consideration of upstream or downstream hardness conditions.

In Order WQ 2008-0008, the State Water Board concluded that regional water boards have considerable discretion in determining ambient hardness as long as the hardness values are protective under all flow conditions. (Order WQ 2008-0008, pp. 10-11.)[1]

[1] This includes, for example, using different receiving water hardness values for wet and dry conditions (*Ibid*, p. 10), using upstream receiving water hardness (*Ibid*, p. 10), or using downstream receiving water mixed hardness (*Ibid*, p. 11).

CSPA continues to state that only the effluent hardness was considered in the development of the CTR metals effluent limits. This is incorrect. The proposed NPDES Permit clearly demonstrates that the reasonable worst-case downstream hardness has been used to calculate the criteria. This is shown in Tables F-5 and F-6. These tables demonstrate that discharge in accordance with the proposed effluent limits for the CTR metals do not cause an exceedance of the CTR criteria in the receiving water. The tables show the fully mixed hardness and metals concentrations downstream of the discharge for all possible flow conditions (i.e., high receiving water flow conditions to the effluent-dominated condition, which can occur at the point of discharge before mixing with the receiving water). CSPA also contends that the effluent hardness cannot be considered in the evaluation of the appropriate CTR criteria.

b) The wrong equations were used to calculate the CTR criteria;

CSPA also contends that the incorrect equations were used to calculate the CTR criteria. This contention is directed at the equation for calculating the ECA for Concave Up Metals (i.e., Equation 4 in the proposed NPDES Permit). Central Valley Water Board staff disagrees. Equation 4 is not used in place of the CTR equation. Rather, Equation 4 is used in place of iteratively determining the reasonable worst-case downstream hardness to use in the CTR equation. Equation 4, which is derived using the CTR equation, is used as a direct approach for calculating the ECA that is always protective considering the reasonable worst-case conditions in the receiving water (i.e., reasonable worst-case downstream hardness). The CTR equation has been used to evaluate the receiving water downstream of the discharge at all discharge and flow conditions to ensure the ECA calculated using Equation 4 is protective. For example, this is shown in Table F-6 of the proposed NPDES Permit, and included below for convenience.

For this discharge, the use of Equation 4 results in more stringent effluent limits for concave up metals than using the CTR equation directly. For example, for acute silver, the lowest possible fully-mixed downstream hardness is 75 mg/L (see last row of Table F-6, below), which corresponds to a total recoverable chronic ECA of 2.5 µg/L, using the CTR equation. However, a lower chronic ECA is required to ensure the discharge does not cause toxicity at any location in the receiving water downstream of the discharge, which would be a violation the Basin Plan's narrative toxicity objective[1]. This is because for concave up metals, mixing two waters with different hardness with metals concentrations at their respective CTR criteria will always result in CTR criterion exceedances[2]. As shown in Table F-6, a chronic ECA of 1.17 µg/L is necessary to be protective under all discharge conditions. In this

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[1] "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." (Basin Plan, p. III-8.01.)

[2] Emerick, R.W.; Borroum, Y.; & Pedri, J.E., 2006. California and National Toxics Rule Implementation and Development of Protective Hardness Based Metal Effluent Limitations. WEFTEC, Chicago, Ill. (p. 5702)

example for acute silver, for any receiving water flow condition (high flow to low flow), the fully-mixed downstream ambient acute silver concentration is in compliance with the CTR criteria.

Table F-6: Acute Silver ECA Evaluation

Lowest Observed Effluent Hardness	**75 mg/L**
Reasonable Worst-case Upstream Receiving Water Hardness	**14 mg/L**
Reasonable Worst-case Upstream Receiving Water Acute Silver Concentration	**0.1 µg/L[1]**
Acute Silver ECA_{acute}[2]	**1.17 µg/L**

Effluent Fraction[6]		**Fully Mixed Downstream Ambient Concentration**			
		Hardness[3] (mg/L) (as $CaCO_3$)	**CTR Criteria[4] (µg/L)**	**Acute Silver[5] (µg/L)**	**Complies with CTR Criteria**
High Flow	1%	14.6	0.1	0.1	**Yes**
	5%	17.1	0.2	0.2	**Yes**
	15%	23.2	0.3	0.3	**Yes**
	25%	29.3	0.5	0.4	**Yes**
	50%	44.5	1.0	0.7	**Yes**
	75%	59.8	1.7	0.9	**Yes**
Low Flow	100%	75.0	2.5	1.2	**Yes**

[1] Reasonable worst-case upstream receiving water acute silver concentration calculated using Equation 1 for acute criterion at a hardness of 14 mg/L.
[2] ECA calculated using Equation 4 for chronic criteria.
[3] Fully mixed downstream ambient hardness is the mixture of the receiving water and effluent hardness at the applicable effluent fraction.
[4] Fully mixed downstream ambient criteria are the chronic criteria calculated using Equation 1 at the mixed hardness.
[5] Fully mixed downstream ambient acute silver concentration is the mixture of the receiving water and effluent lead concentrations at the applicable effluent fraction.
[6] The effluent fraction ranges from 1% at the high receiving water flow condition, to 100% at the lowest receiving water flow condition (i.e., effluent dominated).

c) The "ambient" Hardness was not Used;

CSPA believes ambient should be defined as the receiving water surrounding the effluent. This is not logical, because the CTR criteria are designed for protection of aquatic life in the receiving water, regardless of whether there is a wastewater effluent discharge or not. The fact that a wastewater discharge is present does not eliminate the Clean Water Act requirement to protect beneficial uses. The reasonable definition of the term "ambient," as applied in the CTR to ensure protection of aquatic life, is that "ambient" refers to the surface water surrounding the aquatic life.

CSPA seems to make this argument to make the case that the upstream receiving water hardness should be used. When there is a wastewater effluent discharge, it is absolutely necessary to consider the effluent hardness when evaluating the CTR criteria downstream of the discharge. The effluent discharges both metals and

hardness. It is not possible to discharge one without the other. Simply ignoring the effluent hardness could result in toxicity downstream of the discharge. CSPA states, however, that, "The wastewater effluent is not 'surface water'.", and cannot be considered, per the CTR. On the contrary, once a wastewater effluent is discharged to a receiving water it becomes the surface water and all beneficial uses must be protected. The CTR states that, "…*the criteria apply throughout the water body including at the point of discharge into the water body*." CTR criteria are receiving water criteria, that apply upstream and downstream of wastewater discharges, even at the point of wastewater discharges. Therefore, it is clear that once a wastewater effluent is discharged to a receiving water, it becomes part of the surface water. Ignoring the effects of the wastewater effluent hardness could result in toxicity in the receiving water.

CSPA further provides a discussion of the biological opinion from the US Fish and Wildlife Service and National Marine Fisheries Service on the promulgation of the CTR. Because the biological opinion was submitted on the proposed CTR rulemaking, US EPA would have considered the specific comment in the development of the final rulemaking of the CTR. Therefore, these comments by CSPA are directed at the CTR, not the proposed NPDES Permit, which must comply with the final CTR and SIP. Central Valley Water Board staff properly applied the SIP and CTR when establishing WQBELs for the CTR metals with hardness dependent criteria.

d) The "Emerick" paper cannot be used

CSPA contends that use of the 2006 Study is inappropriate because it does not utilize the hardness of the surface water, does not use the CTR equations, and ignores other water quality parameters that affect the toxicity of metals. Central Valley Water Board staff disagrees. As discussed above, the effluent limits in the proposed NPDES Permit are not based solely on the effluent hardness. They are based on the reasonable worst-case downstream ambient hardness, and consider the effect of the effluent hardness on the receiving water. This is consistent with the SIP, CTR, and the Davis Order, and is entirely appropriate. Also discussed above, the 2006 Study utilizes the CTR equations to establish the CTR hardness-dependent metals criteria.

Finally, CSPA's contention regarding the use of only hardness, and ignoring other water qualities that affect metal toxicity (e.g., pH, alkalinity, dissolved organic carbon, calcium, sodium, chloride, etc.), to establish the CTR criteria is misplaced. As CSPA commented, US EPA has also released a Clean Water Act section 304 criteria document for copper based on the Biotic Ligand Model (*Aquatic Life Ambient Freshwater Quality Criteria—Copper 2007 Revision*) (BLM). The criteria document is a non-regulatory scientific assessment intended as guidance only. (*Id.,* Foreward, p. iii.) Thus, the BLM cannot be used in developing WQBELs in NPDES permits; an EPA-approved Basin Plan or SIP amendment allowing adjustment of the established criteria must be completed, or US EPA must change the CTR. Therefore, these

comments by CSPA are directed at the CTR, not the proposed NPDES Permit, which must comply with the final CTR and SIP. CSPA's contention is with regard to the CTR, not the proposed NPDES Permit. The Central Valley Water Board is required to implement the CTR and SIP, which for the hardness-dependent metals, means using hardness to establish the CTR criteria.

e) Establishing a Protective Limitation.

CSPA contends that "For the great majority of wastewater discharges to surface waters the hardness of the effluent is much greater than the hardness or the upstream surface water. In such cases, use of the higher hardness of the effluent to calculate discharge limitations for hardness dependent metals results in significantly less stringent discharge limitations." The Emerick method properly implements the CTR, by using the reasonable worst-case downstream ambient hardness to calculate the CTR criteria. As stated above, this is consistent with the CTR, SIP, as well as the Davis Order, which is applicable to this discharge.

CSPA also comments that "It has been questioned whether the Regional Board's default use of the "Emerick" method constitutes an underground regulation. 'Regulation' means every rule, regulation, order, or standard of general application or the amendment, supplement, or revision of any rule, regulation, order or standard adopted by any state agency to implement, interpret, or make specific the law enforced or administered by it, or to govern its procedure." (Government Code section 11342.600)."

In June 2009, CSPA requested the Office of Administrative Law to issue an opinion finding the "Emerick" method to be an underground regulation. The Office of Administrative Law rejected CSPA's claim, and declined to issue an opinion.

CSPA Comment G. The Proposed Permit Contains No Antidegradation Analysis.

CSPA comments that the proposed NPDES Permit contains no antidegradation analysis and does not comply with the requirements of section 101(a) of the Clean Water Act, Federal Regulations 40 CFR section 131.12, the State Board's Antidegradation Policy (Resolution 68-16) and California Water Code sections 13146 and 13247. CSPA states that hardness was increased through the facility's treatment, which subsequently lowered effluent limitations for copper and zinc. CSPA contends that the intentional act of adding a pollutant to the wastestream cries out for a full antidegradation analysis. In addition, CSPA states that removal of effluent limitations allows for a discharge above the previously regulated limit. CSPA further states that the allowance of a mixing zone also requires an antidegradation analysis.

RESPONSE: Water Codes Section 13146 and 13247 require other state agencies to comply with water quality control plans when those agencies are discharging waste. Although these sections are not relevant here, staff concurs that the Central

Valley Water Board must comply with state and federal antidegradation policies when issuing NPDES permits. However, the proposed NPDES Permit complies with those policies.

The proposed NPDES Permit is for an existing discharge with no increase in capacity or permitted flow, and contains new effluent limitations, or effluent limitations that are at least as stringent as in existing Order R5-2008-0177, with the exception of the dichlorobromomethane. State Water Board and EPA guidelines do not require a new antidegradation analysis. (Memo to the State Water Resources Control Board from William Attwater, memo to Regional Board Executive Officers (10/7/87), p.5; *EPA Water Quality Handbook 2d*, § 4.5.) Nevertheless, the Fact Sheet evaluates pollutant by pollutant the impact to waters of the state and demonstrates that such discharges will not unreasonably degrade the waters of the state as described below. To address CSPA's comments, a simple antidegradation analysis was conducted and discussed in the Fact Sheet. Central Valley Water Board staff reasonably concludes that the Discharger is implementing BPTC and that the allowable degradation taking place downstream of the mixing zone assures the highest water quality consistent with maximum social and economic benefit to the people of the State will be maintained. (Attwater memo p. 3.)

For dichlorobromomethane, effluent limitations were recalculated using allowable dilution credit from an approved mixing zone study. However, the volume of this discharge (0.69 mgd) is small when compared to the receiving water body. Moreover, because the dilution credit granted in the proposed NPDES Permit was based on the performance of the disinfection system, which is BPTC, and does not grant the full assimilative capacity of the receiving water body, the discharge of this size is not expected to cause degradation. In addition, concentrations of dichlorobromomethane in the discharge have steadily improved. Existing Order R5-2008-0177 states that the maximum effluent concentration (MEC) in the discharge at that time was 8.4 µg/L, and since adoption of that Order, the MEC in the discharge is 1.6 µg/L. This indicates that the effluent quality is improving as a result of the Discharger's implementation of BPTC, and that water quality has not been degraded. Granting of performance-based dilution credits in the proposed NPDES Permit does not allow an increase in the concentrations of dichlorobromomethane in the discharge.

CSPA states that the Discharger increased hardness in the effluent through a treatment process change. CSPA is correct. Since adoption of existing Order R5-2008-0177, to stabilize the pH for effectiveness of the nitrification/denitrification activated sludge process, the Discharger modified operations from the previous addition of sodium hydroxide to the existing addition of lime as a permanent operational change. The Discharger found that the use of lime as a buffer in the nitrification/denitrification process has reduced the need for post-chlorination/dechlorination sodium hydroxide addition as well as reducing sodium in the effluent. This operational change does not lower water quality, and actually

prevents the addition of other chemicals that were previously being used; therefore an antidegradation analysis is not required.

CSPA also states that the effluent limitations for copper and zinc contained in existing Order R5-2008-0177 increased due to recalculation based on ambient hardness, and thus, the proposed NPDES Permit does not contain applicable effluent limitations. Again CSPA's statement is correct. However, the increase in effluent limits for copper and zinc, based on new ambient hardness data, does not lower water quality because the effluent discharge has not changed. The analysis in the permit renewal process must be based on updated data to have updated protection of the receiving water in its current conditions. This is also true where there is no reasonable potential for the discharge to cause or contribute to exceed water quality objectives in the receiving water for carbon tetrachloride, chronic whole effluent toxicity, nitrate plus nitrite, nitrite, and settleable solids. Thus, an antidegradation analysis is not required.

As required by the Clean Water Act's technology-based standards for publicly owned treatment plants (POTWs), the Facility meets or exceeds secondary treatment standards as well as more stringent water-quality and performance-based effluent limitations.

Mixing zones do not violate state or federal antidegradation policies. (Attwater memo, p. 2; *EPA Water Quality Standards Handbook 2d.,* §§ 4.4, 4.4.4, and Appendix G (Questions and Answers), p. 2.) Water quality standards are not required to be met within mixing zones. An antidegradation analysis is not required for areas within a mixing zone, as long as the requirements of the mixing zone policy are met. (*American Wildlands v. Browner* (10th Cir. 2001) 260 F.3d 1192, 1195-1196, 1198.) Only a "simple" antidegradation analysis is required for a mixing zone under the State Water Board Guidance. A "simple" antidegradation analysis consists of a finding that the mixing zone will not be adverse to the purpose of the state and federal antidegradation policies. (Attwater memo, p. 2.) The following Finding in section IV.D.4. of the Fact Sheet has been modified as shown in underline format below:

4. Satisfaction of Antidegradation Policy

This Order does ~~not~~ allow for an increase in ~~flow or~~ mass of pollutants to the receiving water. <u>However, as a result of the Discharger's implementation of BPTC for the existing discharge, effluent quality has improved.</u> Therefore, a complete antidegradation analysis is not necessary. The Order requires compliance with applicable federal technology-based standards and with WQBELs where the discharge could have the reasonable potential to cause or contribute to an exceedance of water quality standards. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the

discharge. The impact on existing water quality will be insignificant due to the small size of the discharge in relation to the size of the receiving water and the tertiary level of treatment of the wastewater prior to discharging to the receiving water.

This Order allows a mixing/dilution zone in accordance with the Basin Plan, the SIP, and EPA's *Water Quality Standards handbook, 2d Edition* (updated July 2007) and EPA's *Technical Support Document for Water Quality-Based Toxics Control*. As discussed in Finding IV.C.2.c. of this Fact Sheet (Assimilative Capacity/Mixing Zone), the mixing zone is as small as practical and complies with all applicable SIP requirements. In addition, this Order includes performance-based effluent limitations for dichlorobromomethane that are more stringent than would be allowed under the mixing zone analysis alone. Therefore, with the Discharger implementing BPTC, the Central Valley Water Board finds that the degradation due to the increase of pollutant concentration allowed by the mixing zone does not impact beneficial uses in the receiving water downstream of the mixing zone, is to the social and economic benefit of the people of the State, and is in accordance with state and federal antidegradation policies.

CSPA Comment H. The Proposed Permit Fails to Contain an Effluent Limitation for Aluminum.

CSPA states that the proposed NPDES Permit fails to contain an effluent limitation for aluminum in accordance with Federal Regulations 40 CFR 122.44, US EPA's Interpretation of the regulation, and California Water Code, Section 13377. CSPA further states that the reasonable potential analysis conducted to determine water quality based effluent limitations failed to consider the statistical variability of data and laboratory analyses as explicitly required by the federal regulations, which would result in a greater number of constituents having effluent limitations. CSPA also states that the proposed NPDES Permit fails to consider the final recommendations of USEPA to use their recommended aluminum criteria absent a site-specific objective, and that the criteria development document is incomplete because it doesn't consider all test results referenced in USEPA's recommended aluminum criteria guidance document, which violates 40 CFR 122.44 and CWC 13377. Additionally, CSPA states that the Arid West Report is not applicable to this discharge, and that the Regional Board failed to follow the legally required procedures for developing water quality standards and applied the recommended water quality levels for Arid West water bodies in NPDES permits.

RESPONSE: Central Valley Water Board staff performed a reasonable potential analysis (RPA) to determine the proposed effluent limitations in accordance with the procedures specified in the SIP, by comparing the maximum effluent concentration (MEC) of a pollutant to the applicable water quality criteria/objective. CSPA's comment that the RPA failed to consider the statistical variability of the data is

commenting on the validity of the SIP to determine reasonable potential to cause or contribute to an exceedance of a water quality standard. The comment is specifically focused on the use of variable multiplier factors that represent the statistical variation and standard deviation of data used for the analysis outlined in the USEPA *Technical Support Document for Water Quality Based Toxics Control* (TSD), compared to the use of the default multiplier of "1" in the SIP. Using the procedures specified in the SIP and its default multiplier, instead of using the variable multiplier factors outlined in the TSD, will not result in lowering the water quality of the receiving water.

Currently there is no State or Regional Water Board Policy that establishes a recommended or required approach to conduct an RPA or establish water quality based effluent limitations for non-federal California Toxic Rule or National Toxic Rule (CTR/NTR) constituents, such as aluminum. However, the State Water Board has held that the Regional Water Board may use the SIP as guidance for water quality-based toxics control. The SIP states in the introduction "*The goal of this Policy is to establish a standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency*." Therefore, for consistency in the development of NPDES permits, Central Valley Water Board staff use the RPA procedures from the SIP for the CTR/NTR constituents and the non-CTR/NTR constituents.

Aluminum criteria was not promulgated as part of the CTR; thus absent numeric aquatic life criteria for aluminum, effluent limitations in the Central Valley Region's NPDES permits are based on the Basin Plans' narrative toxicity objective. Therefore, Central Valley Water Board staff conducted an extensive research review and considered all relevant information from 1) *US EPA Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* (Guidelines), 2) *US EPA National Recommended Ambient Water Quality Criteria*, and subsequent *Correction*, and 3) site-specific aluminum studies conducted by dischargers within the Sacramento Area of the Central Valley Region for determining the appropriate application of aluminum water quality objectives to comply with the Basin Plans' narrative toxicity objective.

Central Valley Water Board staff disagrees that the proposed NPDES Permit does not protect against mortality and reductions to growth and reproduction. In 1988, US EPA in following their Guidelines to derive criteria first calculated an aluminum chronic criteria of 1502 µg/L, which was greater than the acute criterion at 748 µg/L and therefore not allowed by the Guidelines. Thus, the chronic criterion defaulted to be the same at 748 µg/L. However, these calculations were based only on three species, *Ceriodaphnia dubia, Daphnia magna, and Pimephales promelas,* instead of the required eight species; thus, US EPA selected a chronic criterion of 87 µg/L based on striped bass (Buckler, et al.) and brook trout (Cleveland, et al.) studies. However, the Buckler study contains conflicting test results on striped bass in waters with hardness at approximately 12 mg/L as $CaCO_3$; the first test showed mortality at pH of 6.0 and aluminum concentrations at 98 µg/L, but the second test did not show

mortality at pH of 6.5 and aluminum concentrations as much as 390 µg/L. Not only does this show considerable discrepancy between the tests, but it also shows that the 87 µg/L chronic criterion is heavily weighted at waters at pH of 6.0 or less and no toxicity at waters at pH of 6.5 or more. 178 samples obtained since adoption of existing Order R5-2008-0177, from December 2008 through May 2011, measured receiving water pH values that ranged from 6.6 to 8.1 standard units (su) with a median of 7.2 su. Within this circumneutral pH range, aluminum is not expected to be toxic as demonstrated by this study. Moreover, the maximum aluminum concentrations in the effluent and the receiving water are 120 µg/L and 23 µg/L, respectively, which is below the 390 µg/L aluminum dose used in this study that showed no toxicity at pH of 6.5 su.

The second study US EPA based the chronic criteria at 87 µg/L, the Cleveland study, was to determine the chronic no-observed-effect concentrations (NOEC) of aluminum on larvae brook trout exposed for 60-days in waters at pH of 6.5 and low-hardness at approximately 12 mg/L as $CaCO_3$. Six tests cells (two controls and four tests) with ten brook trout eggs in each cell were observed up to 60 days from hatching. At the end of the 60-days, brook trout larvae in waters dosed with 88 µg/L of aluminum, which is the level of protection imposed when applying US EPA chronic criteria, showed 1% greater survival, 1% reduction in length, and 4% reduction in weight in comparison to the control; and those dosed with 169 µg/L of aluminum showed 1.5% greater survival, 5% reduction in length, and 24% reduction in weight. Though the brook trout larvae dosed at 88 µg/L of aluminum showed reduction in growth, the results are very minor at 1% reduction in length and 4% reduction in weight. More importantly, US EPA's chronic criterion is based on this one test result.

Central Valley Water Board staff acknowledges the potential impact to aquatic life as a result of aluminum toxicity that may occur in receiving waters with pH outside the circumneutral pH ranges of 6.5 to 8.5 and at low hardness (12 mg/L as $CaCO_3$), which are typically found within the foothills of the Sacramento Area. But in this case, the pH, which primarily drives aluminum toxicity, is within the range where aluminum is expected to be least toxic. Moreover, EPA's two studies were also conducted at low hardness of 12 mg/L as $CaCO_3$. The Discharger only obtained three hardness samples during a very short period, August 2011 at 14 mg/L as $CaCO_3$, October 2011 at 26 mg/L as $CaCO_3$, and November 2011 at 35 mg/L as $CaCO_3$, which is not an adequate representative sampling period to determine the water quality characteristics of the receiving water. An adequate data set should capture the changing conditions of the receiving water throughout the calendar year covering all seasons, and during multiple years to capture receiving water conditions during dry and wet years. Thus the proposed NPDES Permit requires the Discharger to monitor the receiving water for hardness and pH.

Central Valley Water Board staff also reviewed twenty-one site specific aluminum toxicity tests conducted by dischargers within the Sacramento Area, as discussed in the Fact Sheet of the proposed NPDES Permit. All twenty-one tests resulted in EC_{50}

toxicity values greater than 5000. Even at a similar site, the City of Auburn, the toxicity test conducted at a pH value of 7.4 su and hardness value of 16 mg/L as $CaCO_3$, which is similar to the water quality characteristic of this receiving water, resulted in EC_{50} toxicity value greater than 5,160; this equates to a WER of >12.4 and subsequent aluminum chronic criteria of 1079 µg/L. Thus these local tests indicate that aluminum is less reactive and thus less toxic to aquatic life in surface waters within the Sacramento Area of the Central Valley Region. Considering all this information, Central Valley Water Board staff determined that US EPA's recommended chronic criterion of 87 µg/L is not appropriate in this case for application of aluminum water quality objectives to comply with the Basin Plans' narrative toxicity objective.

CSPA also states that the Arid West Report is not applicable to this discharge and should not have been used. The Arid West Report was not used for determining the appropriate application of aluminum water quality objectives to comply with the Basin Plans' narrative toxicity objective; however the Fact Sheet of the proposed NPDES Permit occasionally and incorrectly quotes this report. Therefore, all references to the Arid West Report have been removed from the Fact Sheet to avoid any further confusion.

The maximum aluminum concentrations in the effluent and receiving water are 120 µg/L and 23 µg/L, respectively. Therefore, the discharge does not show reasonable potential to exceed the Department of Public Health Secondary MCL of 200 µg/L for drinking water aesthetic conditions or US EPA recommended acute criterion of 750 µg/L for protection of aquatic species. Thus, the discharge complies with the Basin Plan's narrative toxicity objective, and the proposed NPDES Permit appropriately does not contain water quality based effluent limitations for aluminum.

CSPA Comment I. The Proposed Permit Fails to Contain an Effluent Limitation for Nitrate.

CSPA comments that the proposed NPDES Permit fails to contain an effluent limitation for nitrate in accordance with Federal Regulations 40 CFR 122.44, USEPA's interpretation of the regulation, and California Water Code section 13377.

RESPONSE: Central Valley Water Board staff does not concur. The USEPA and the Department of Public Health consider 10 mg/L the primary maximum contamination limit (MCL) for nitrate. Based on 132 samples for nitrate taken since adoption of existing Order R5-2008-0177, from December 2008 through May 2011 and as detailed in the Fact Sheet section IV.C.3.a.v., the maximum effluent concentration was 5.26 mg/L. The discharge does not have reasonable potential to cause or contribute to an in-stream excursion above the primary MCL objective. Therefore, the NPDES Permit appropriately does not contain an effluent limitation for nitrate.

CVCWA COMMENTS

CVCWA Comments A and B (combined). Effluent limits for dichlorobromomethane should be revised based on a dilution of 7.28:1.

CVCWA comments that the tentative NPDES Permit raises serious concerns involving the application of the state and federal antidegradation policies to deny dilution credit in calculating water quality-based effluent limitations for dichlorobromomethane. CVCWA further comments that the proposed NPDES Permit impermissibly denies calculated dilution credits and truncates effluent limitations without making requisite findings. CVCWA asserts that the findings in the proposed NPDES Permit must clearly explain the basis for establishing the more stringent effluent limitations for dichlorobromomethane.

RESPONSE: Based on the mixing zone study, considering the available mixing and dilution in Deer Creek under reasonable worst-case conditions for dichlorobromomethane, a dilution credit of up to 7.28:1 may be allowed for tertiary level treated effluent discharge. However, the dilution credit was reduced based on the following policies:

(1) In accordance with Section 1.4.2.2 of the SIP, mixing zones must be as small as practicable, and
(2) In accordance with State and federal antidegradation policies, degradation of the receiving water downstream of the edge of mixing zone must be minimized by the implementation of Best Practical Treatment or Control.

Based on the maximum available physical dilution of 7.28:1 in the receiving water, the mixing zone extends 236 feet downstream, and the maximum daily effluent limit would be 4.1 µg/L. The allowed dilution credit of 4.1:1 was based on effluent monitoring data for dichlorobromomethane, and therefore, the Facility can consistently comply with the maximum daily and average monthly effluent limits of 2.3 µg/L and 4.6 µg/L, respectively, for dichlorobromomethane. This represents a mixing zone that is as small as practicable for this Facility.

Although the Antidegradation Policy does not apply within a mixing zone, the allowance of a mixing zone allows an increase in the concentration and loading of pollutants discharged. Therefore, when a mixing zone and dilution credits are allowed, it is necessary to ensure the degradation of the receiving water downstream of the mixing zone complies with the Antidegradation Policy. The Antidegradation Policy requires, in part, the following:

"*Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the* ***best practicable treatment or***

> ***<u>control of the discharge</u>*** *necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained." (Emphasis added)*

The Antidegradation Policy requires that a discharge shall meet BPTC, which in this case for dichlorobromomethane are, at minimum, existing Facility performance. Allowing the full dilution credit would allow the Discharger to increase its loading of these constituents to Deer Creek (downstream of the mixing zone) and reduce the treatment and control of the pollutant. Allowing a discharger to reduce the level of treatment and/or control would not comply with the BPTC requirements of the Antidegradation Policy.

Clarifying language has been added to the Fact Sheet of the proposed NPDES Permit regarding truncating the maximum dilution for dichlorobromomethane.